REMARKS

This application has been reviewed in light of the FINAL REJECTION mailed January 28, 2010. Reconsideration of this application in view of the below remarks is respectfully requested. Claims 1 and 3 are pending in the application with Claim 1 being in independent form. By the present amendment, minor amendments to Claims 1 and 3 are made in an effort to clarify the features of the claimed invention. Therefore, no new subject matter is introduced into the disclosure by way of the present amendment.

I. Rejection of Claims 1 and 3 Under 35 U.S.C. § 103(a)

Claim 1 is rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 5,109,417 issued to Fielder et al. Additionally, Claim 3 is rejected under 35 U.S.C. § 103(a) as allegedly obvious over Fielder et al. in view of U.S. Patent No. 3,754,101 issued to Daspit et al.

Fielder et al. relates to a high-quality, low bit-rate digital signal processing of audio signals. (See: column 1, lines 14 to 15). It is an object of Fielder et al. to provide for digital processing of wideband audio information using an encode/decode apparatus and a method which provide high subjective sound quality at an encoded bit rate as low as 128 Kbs. (See: column 6, lines 17 to 22). Moreover, Fielder et al. discloses a further object of the invention, which is to provide: "an encode/decode apparatus and method embodied in a digital processing system having a high degree of immunity against signal corruption by transmission paths". (See: column 6, lines 31 to 34).

By contrast, the present invention relates to signal processing of signals containing interference, in which the timing characteristics of bursts in the interfering or unwanted signal is used for reducing the amplitude of those bursts relative to other elements in the received signal.

Paragraph 5 of the Final Rejection states that "as shown in figures 4-6, Fielder et al. discloses a method for digitally processing a signal in a frequency domain containing regular bursts of unwanted signal" and refers to column 15 lines 43 to 46.

Figures 4 to 6, as described at column 10, lines 48 to 60 of Fielder et al., illustrate "a hypothetical graphical representation showing a time-domain signal sample block" (Fig. 4), "a further hypothetical graphical representation of a time-domain signal sample block showing discontinuities at the edges of the sample block caused by a discrete transform assuming the signal within the block is periodic" (Fig. 5), "a functional block diagram showing the modulation of a function X(t) by a function W(t) to provide the resulting function Y(t)" (Fig. 6a) and "further hypothetical graphical representations showing the modulation of a time-domain signal sample block by an analysis window" (Figs. 6b to 6d).

The discrete transform creates the errors in the signal that is being processed due to the assumption that the signal in the block is periodic. (See: column 15, lines 43 to 46). Thus, there is no teaching or suggestion of "regular bursts of unwanted signal" as recited in Claim 1. In fact, the interpretation asserted in the present Office Action that the errors correspond to the "regular bursts of unwanted signal" is incorrect, as the errors are created during the processing of the signal, and thus are not present in the received signal that is to be processed.

In relation to Fig. 5, the only description of this figure (apart from that mentioned above) is at column 15, lines 46 to 48, where it is stated that "these transform errors are caused by discontinuities at the edges of the block as shown in FIG. 5". Thus, there is no teaching of "establishing timing characteristics of the unwanted signal bursts to establish their positions in a portion of said signal", as recited in Claim 1. While it may be assumed from Fig. 5 that there could be a regular timing to the discontinuities due to the selection of the sample blocks, it is

stressed that these discontinuities are not present in the received signal but are created as part of the processing.

Fig. 6 of Fielder et al. illustrates how discontinuities are smoothed to reduce transform errors. In particular, the received signal is multiplied by a weighting function to provide a signal for processing that falls within an envelope as shown in Fig. 6d. The present Office Action asserts that Fig.6c and column 15, lines 48 to 51 disclose the step of "generating a time domain window function using said established timing characteristics, said time domain window being a sinusoidal function having a zero crossing substantially coinciding with the position of each unwanted signal burst". While Fig. 6c illustrates the weighting function that is applied to the incoming signal shown in Fig. 6b, this weighting function is not generated using the established timing characteristics, as recited in Claim 1.

Moreover, there is no teaching in Fielder et al. of the "time domain window being a sinusoidal function having a zero crossing coinciding with the position of each unwanted signal burst". Fielder et al. discloses the use of a "discrete transform that has the function equivalent to the alternate application of a modified Discrete Cosine Transform (DCT) and a modified Discrete Sine Transform (DST)". (See: column 7, lines 60 to 63) However, this is not the same as "a sinusoidal function having a zero crossing substantially coinciding with the position of each unwanted signal burst", as recited in Claim 1.

In relation to "zero crossings", Fielder et al. teaches away from their use. In particular, the encoder modulates each sample block using an analysis window and the decoder reconstructs the signal using a synthesis window that has "characteristics inverse to those of the means in the encoder" and "the synthesis window has characteristics such that the product of the synthesis-window response and the response of the analysis-window...produces a composite

response which sums to unity for two adjacent overlapped sample blocks". (See: column 7, lines 24 to 55).

It is also stated in Fielder et al. that "a single FFT is utilized to simultaneously calculate the forward transform for two adjacent signal sample blocks…a single FFT is utilized to simultaneously calculate the inverse transform for the two transform blocks". (See: column 7, line 67 to column 8, line 6). It is impossible to perform an inverse transform on a zero value. This is supported by the passage at column 4, lines 3 to 8 of Fielder et al., which stated that "the recovered signal interval or block may be multiplied by an inverse window, one whose weighting factors are the reciprocal of those for the analysis window…it clearly requires that the analysis window not go to zero at the edges".

It is noted that the present Office Action introduces terminology into the analysis of Claim 1, which makes Fielder et al. appear more relevant, namely, at the top of page 4 of the Final Rejection, "a near-zero crossing". Claim 1, as discussed above, does not recite nor contemplate "near-zero crossing". Moreover, a value close to zero is not the same as a value that is zero – particularly as Fielder et al. requires that the value does not go to zero. Also, the sinusoidal function used in the present invention, and recited in the claims, must have a zero crossing as is clearly described at page 4, lines 17 to 25 of the specification as originally filed.

Column 15, lines 51 to 55 of Fielder et al. describes how a block is modified and that "the multiplier circuit shown in FIG. 6a modulates the sampled input signal x(t) shown in FIG. 6b by the weighting function shown in FIG. 6c" as stated in the second bullet point on page 4 of the Final Rejection. However, as discussed above, the errors at the edges of the sampled blocks in Fielder et al. do not constitute the unwanted signal bursts of the received signal, and thus the application of "the generated window to said signal portion to selectively reduce the

amplitude of said unwanted signal bursts relative to other elements of said signal" is not taught or suggested by Fielder et al.

As conceded in the Final Rejection, Fielder et al. "does not specifically disclose a "zero crossing" substantially coinciding with the position of each unwanted signal burst" but that "it would have been obvious to one of ordinary skill in the art at the time the present invention was made to make the samples at the block edges zero to better (more completely) eliminate any discontinuities at the block edges". It is submitted that if one of ordinary skill in the art started with the teachings of Fielder et al., it would not be possible to arrive at the features as claimed in claim 1. This is because, as discussed above, the discontinuities cannot go to zero because of the requirement for the decoder to perform an inverse transform on the encoded signal. Consequently, modification of Fielder et al. to have a zero crossing would render the result decoder inoperable.

Column 3, line 25 to column 4, line 47 of Fielder et al. discusses transform coding errors. However, column 4, lines 3 to 8 clearly state that it is important that "the analysis window not got to zero at the edges", as discussed above. It is therefore submitted that Claim 1 is patentably distinguished over the teachings of Fielder et al.

Dependent Claim 3 recites the steps of (iv) applying a Fourier transform to the output signal output to provide a transformed signal; and (v) applying an algorithm to restore the shape of peaks in the transformed signal to an approximation of their form in the absence of the regular bursts of unwanted signal. Since Claim 3 depends from independent Claim 1, the features recited in that independent claim are included in Claim 3. Consequently with respect to Fielder et al., it has been shown that the features recited in Claim 1 are not obvious in view of the teaching and suggestion in Fielder et al.

Regarding step (v), the present Office Action states that "Daspit ... discloses applying an algorithm to restore the shape of the peaks in the transformed signal to an approximation of their form in the absence of said unwanted signal elements". It is submitted that this is not the case.

The passages relied on by the Final Rejection state that "this step in the process of signal preparation for encoding yields the well known and conventional quadrature phase-multiplex AM-DSB-SC (amplitude modulation, double sideband, suppressed carrier) type of spectrum" (See: column 4, lines 21 to 24) and "balanced modulation is used so that the resulting encoded information signal appears as a group of AM-DSB-SC signals with as many sideband pairs as there are lines in the encoding frequency-rate spectrum" (See: column 4, lines 40 to 44). Neither of these passages teaches or suggests "applying an algorithm to restore the shape of the peaks in the transformed signal to an approximation of their form in the absence of said unwanted signal elements" as recited in Claim 3.

Moreover, these passages refer to the encoding of signals and not to "a method for digitally processing a signal in a frequency domain containing regular bursts of unwanted signal". Furthermore, Daspit et al. fails to overcome the deficiencies identified above in Fielder et al..

The present Office Action also states that it would have been obvious "to modify the invention of Fielder as taught by Daspit and apply an algorithm to restore the shape of peaks in the transformed signal to an approximation of their form in the absence of said unwanted signal elements, thus allowing the retaining of only the useful spectral elements". The present Office Action cites the passage at column 4, lines 36 to 40 in support of this assertion.

This passage states that "in the preferred embodiment, the "sum" frequency modulation products are discarded leaving only the "difference" frequency products as useful encoder outputs, although the sum products could be used and the difference products discarded if desired". Whether it is the "sum" or "difference" products that are kept, there is no teaching or suggestion that the shape of the peaks in the transformed signal are restored to an approximation of their form in the absence of the unwanted signal elements.

Therefore, Fielder et al. and Daspit et al., taken alone or in any proper combination, fail to disclose or suggest the features recited in Applicant's Claims 1 and 3. Consequently, Claims 1 and 3 are believed to be allowable over the cited prior art references. Accordingly, Applicant respectfully requests withdrawal of the rejections with respect to Claims 1 and 3 under 35 U.S.C. § 103(a) over Fielder et al. singly or in combination with Daspit et al.

CONCLUSIONS

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1 and 3 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Applicant's undersigned attorney at the number indicated below.

Respectfully submitted,

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